

LETTER TO THE EDITOR

Emergence of SARS-CoV-2 Variant: A wake-up call for Pakistan's overburdened healthcare system

Dear Editor,

Coronavirus disease (COVID-19) outbreak caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is swiftly increasing from the past few weeks.¹ This pandemic is getting worst day by day; as of January 12, 2021, cumulative confirmed cases have reached 88 million, and the death toll crossed 1.9 million.^{1,2} In Pakistan, an unprecedented resurgence of COVID-19 has been observed, and the current count has reached over half a million, with more than 10 thousand deaths so far.² The devastating effect of COVID-19 on Pakistan's severely strained health service has already been highlighted in recent studies.³⁻⁶ Dreadfully, a variant of concern (VOC-202012/01), previously known as VUI-202012/01, was first identified in the United Kingdom (UK). As of December 13, more

than 1100 cases of this variant contagion have been reported throughout the UK, although the actual numbers could be higher. This outbreak initially emerged in South-East England and spread quickly to other UK regions, including Wales and Scotland.⁷ Alarming, The health department in Sindh has confirmed that 12 samples of UK returnees have been tested for genotype, six of them observed positive, and three of these showed the COVID-19 variant in the early phase.⁸ Furthermore, as per a recent report, a total of 101 passengers arrived at Khyber Pakhtunkhwa province from the UK, indicating forthcoming devastation, as shown in Figure 1.⁹

Genetic analysis revealed 23 different mutations, 17 of which have been associated with viral proteins in the SARS-CoV-2 genome.¹⁰ However, VOC-202012/01 revealed that N501Y

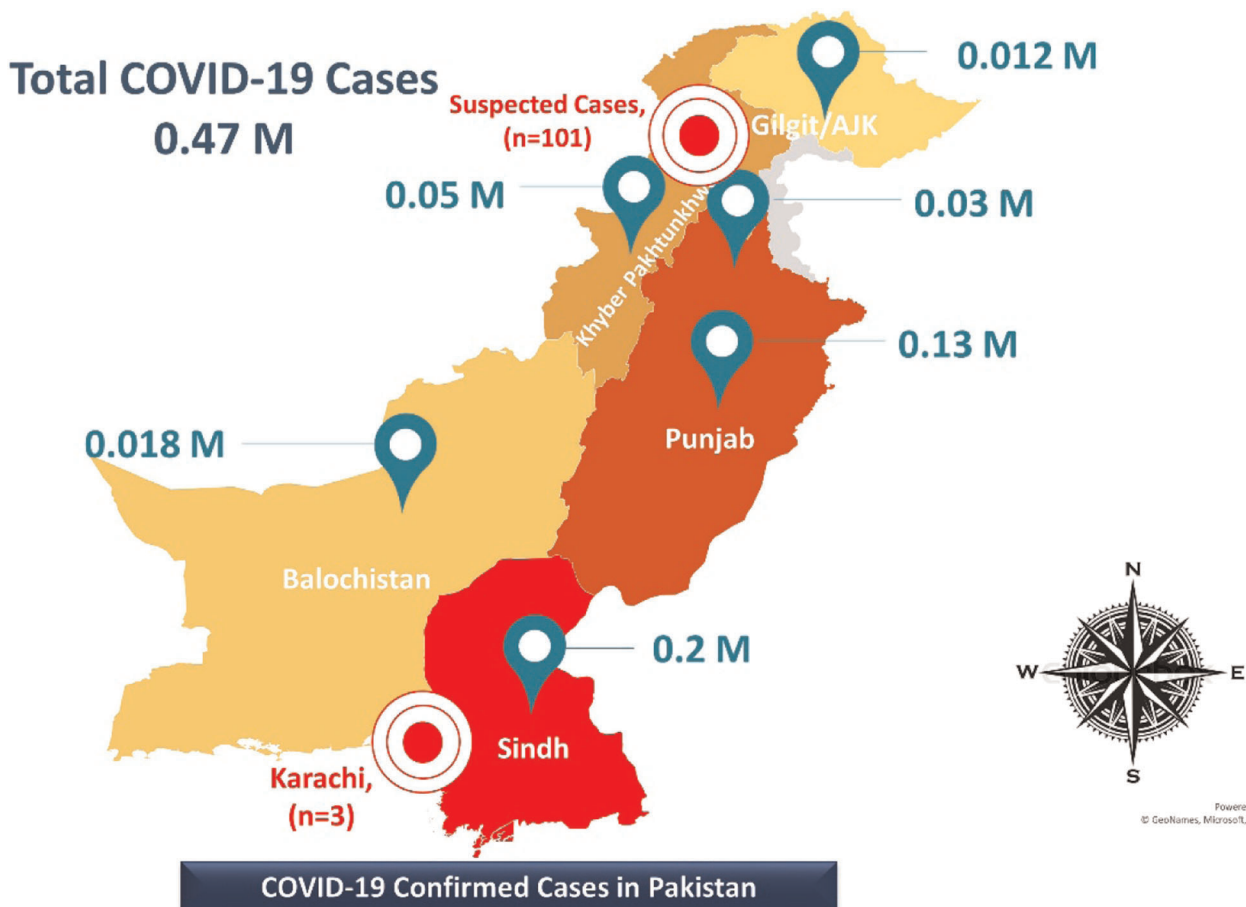


FIGURE 1 COVID-19 confirmed cases in different provinces of Pakistan, by date 29-12-2020¹

mutation is currently known to be the most significant, as expressed in the spike-protein that causes relatively tight viral binding with the host angiotensin-converting enzyme (ACE2) receptors.¹¹ In theory, alteration in this spike protein sequence can lead to a more contagious and rapid viral spread.⁷ At this time, the paucity of published data is available on the other spike variants, except D614G. Plante and colleagues¹² did genetic engineering in USA-WA1/2020 SARS-CoV-2 stain with modified spike D614G substitution, which resulted in more efficient replication in human lung epithelial cells and primary human airway tissues. Sera from D614 infected hamsters showed modestly higher neutralization rates with the virus G614 when compared to virus D614. In addition, the mutation in clinical trials to defend against COVID-19 is unlikely to decrease its capability for vaccines; however, therapeutic antibodies to the G614 virus should be tested.^{12,13} Moreover, other mutations in VOC-202012/01 are categorized as 14 non-synonymous, 06 synonymous, and 03 deletions (69/70 deletion, P681H, and ORF8 stop codon [Q27stop]).¹⁰

The whole world is confronting an unpredictable time due to the pandemic of COVID-19; however, Pakistan's health budget-2020 did not foresee anything exceptional. The annual budget for 2020–2021, with a total outlay of \$44 billion, was supposed to concentrate on the health sector in this pandemic. Appallingly, only \$155 million was allocated for the population of 22 crores (\$0.7 for each individual).¹⁴ Pakistan had already been affected by several climatic and geological disasters, including earthquakes, floods, heatwaves, drought, and

cyclones, thus exacerbating economic damage.¹⁵ According to the World Bank, due to the extreme pandemic crisis, Pakistan is expected to decline its GDP growth by 1.3% over the past few months of the fiscal year.¹⁶ Simultaneously, this deadly pandemic has created widespread consequences, and healthcare systems have surpassed their capacity. Along with the rising human death toll and the escalating chaos, healthcare services are decentralized and fragmented. As a low-income country, Pakistan, with impoverished medical facilities persistent, shortage of healthcare personnel, increasing medical costs, shortage of medical equipment, and severe financial woes, cannot cater to the re-epidemics of VOC-202012/01 if it occurs, then the health sector might collapse, as shown in Figure 2.¹⁷ An exponential rise in VOC-202012/01 cases, there will be a nationwide scarcity of ventilators. If hospitals remained overloaded in Pakistan, hard decisions on who gets access to ventilators would be the only option left for practitioners, as happened in Italy.¹⁸

The readiness of the Pakistan healthcare system to withstand the reemergence of COVID-19 cases is very uncertain. Lockdown measure indirectly caused the disruption of infection prevention and control programs effective in Pakistan,¹⁹ which might cause secondary outbreaks of other infections and vaccine-preventable diseases. Amid numerous conspiracy theories, vaccine hesitancy remains a significant challenge for Pakistan. In a country where vaccine reluctance is a major obstacle to curbing vaccine-preventable diseases, such speculation will be an unneglectable challenge for the COVID-19 vaccination. However, we believe other

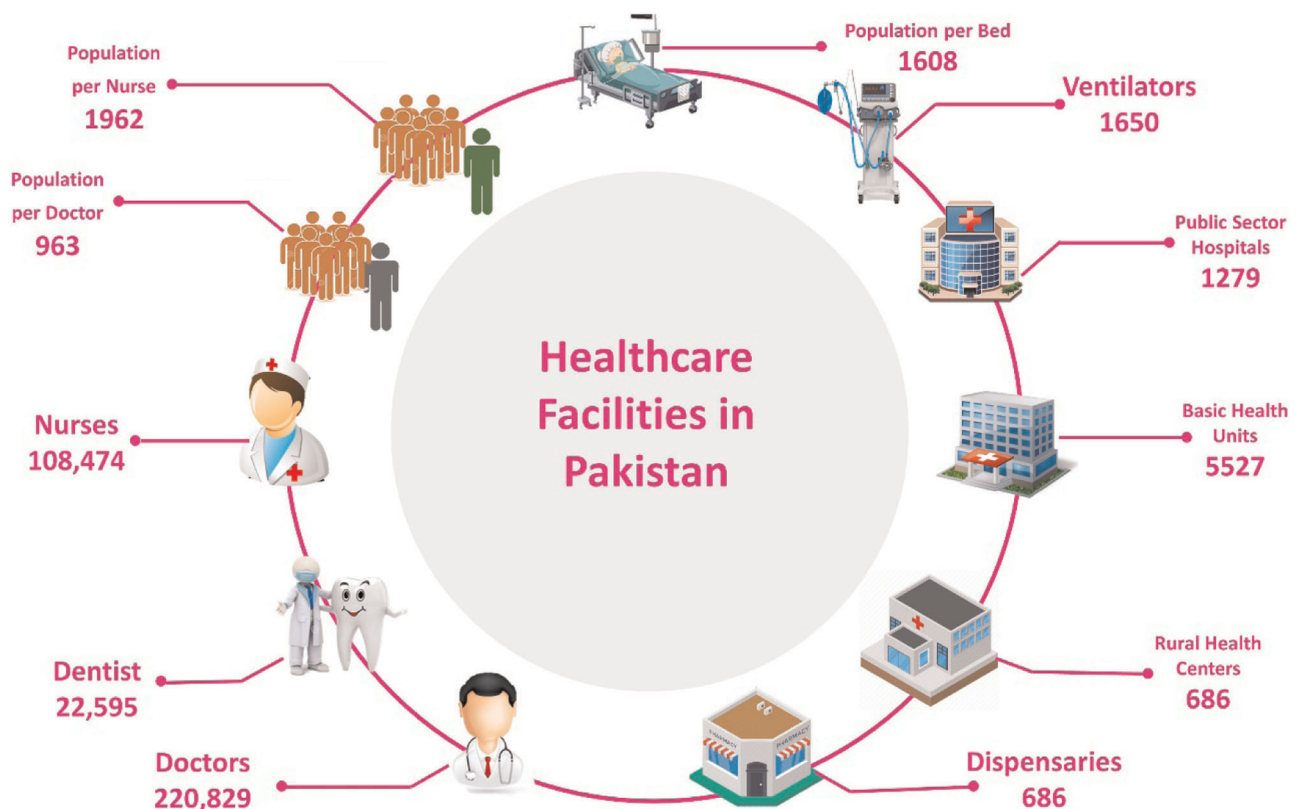


FIGURE 2 Number of different healthcare facilities available in Pakistan (data accessed by Nadia et al., 2020)¹²

reasons for not eliminating polio from developing countries like, illiteracy, improper storage conditions of vaccines during travel in the country.²⁰

The current pandemic has uncovered significant challenges and flaws in Pakistan's emergency and health processes concerning infectious disease prevention.²¹ Apparently, three areas need the utmost priority, including synchronized federal-provincial responses, stock management and purchasing personal protective equipment (PPE), and emergency equipment (ventilators, respirators, etc.). Efficient government interventions and concrete actions must be taken to educate peoples and deal with their wrong perceptions. If policy-makers do not act wisely, the country will face a massive tragedy.


Recommendations for Healthcare System:

1. Public awareness campaigns must be initiated using print/mass-media or posters/banners for the preventive measures from COVID-19.
2. Quarantine and social distance must be applied stringently after getting the positive test results of SARS-CoV-2.
3. Adequate funding must be allocated for the healthcare sector to cater to this pandemic. COVID-19 variant cases must be tracked, tested, quarantined, and strict local lockdown should be implemented.
4. International travel from hotspot areas must be restricted, whereas proper screening, testing, and thermal scanning must be launched.
5. Internal travelers should be monitored and checked in Pakistan for at least one week if they experience any symptoms.

DATA AVAILABILITY STATEMENT

All data used in this study are publicly available.

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